

BUTTERFLIES OF THE HAWAIIAN ISLANDS

ACCORDING TO THE STAND OF LATE 1976

J. C. E. RIOTTE, M.A.¹ and G. UCHIDA, B.A.²

¹Research Associate, Department of Entomology, B. P. Bishop Museum, P.O. Box 6037, Honolulu, Hawaii 96818 and Department of Entomology and Invertebrate Zoology, Royal Ontario Museum, Toronto M5S 2C6, responsible for tekst.

²U.S. Dept. of Agric., Animal and Plant Health Inspection Service, Plant Protection and Quarantine Programs, Port of Honolulu, Hawaii, to whom CREDIT is due for all the photographic work.

DIFFERENT REASONS COULD BE QUOTED for this informative paper: first the fact that in some recently published compendia, like Lewis, *Butterflies of the World* (1973) and Howe, *The Butterflies of North America* (1975), some of the butterflies of the Hawaiian Islands which, as everybody knows, belong to the Indo-Australian fauna, are entirely or partially included with the bulk of the nearctic species; second the fact that the interest in our lepidopterous fauna is growing as we see from Ehrlich's paper (1976) and the many letters and phone calls from interested collectors visiting the Islands. Here then shall be a short annotated list of what we have at the moment, when it was first recorded and from where it reached us, if known.

HESPERIIDAE

1. *Erionota thrax* (Linné), the banana skipper, a native of most of S and E Asia, including India, China, Moluccas, Malaya, Philippines, Guam. First recorded in August 1973 at Hickam Air Force Base, Honolulu. During 1974 established also on Kauai and Maui, throughout 1975 on Hawaii, Molokai and Lanai. Regrettably the damage this large and beautiful skipper is able to inflict on banana plantations can be extensive.

2. *Hylephila phyleus* (Drury), the fiery skipper, a native of South and North America and the West Indies. First recorded 8 September 1970 at Salt Lake, Honolulu, a short distance north of Honolulu International Airport and Hickam Air Force Base. Until 1974 only on Oahu, in October 1974 also on Hawaii. Not damaging to lawns as it is usually on the mainland.

PAPILIONIDAE

3. *Papilio xuthus* Linné, the citrus swallowtail, with a wide range from India through China to Korea, Japan, Formosa, Ryukyu and Bonin Islands, Philippines, also Siberia, Burma, Guam. First recorded during April 1971 at Salt Lake, Honolulu; June 1972 in Kauai; June 1974 in Maui and Hawaii; August 1974 in Molokai and September 1974 in Lanai.

PIERIDAE

4. *Pieris rapae* (Linné), the cabbage butterfly, almost cosmopolitan. According to Perkins (1913) appeared first, introduced with cabbages from California, in 1897. There is no seasonal dimorphism in the Hawaiian cabbage butterflies. All specimens belong to the European summer form. The species is, of course, found on all islands.

DANAIDAE

5. *Danaus plexippus* Linné, the monarch butterfly. Perkins (1913) says: "no doubt a natural immigrant, which has established itself in the islands since the introduction of the milkweed, on which it feeds, by foreigners," between 1845 and 1850. Albino monarch butterflies occur not infrequently.

HELICONIIDAE

6. *Agraulis vanillae* (Linné), the "gulf fritillary". For the first time taken in Honolulu, Manoa, 14 January 1977 by Keith T. Arakaki and Elizabeth A. Perry, both of the Department of Entomology, B. P. Bishop Museum. There were many males and females of the species on the wing and it seems to be well established although there is not the slightest suggestion how it may have arrived on the island.

NYMPHALIDAE

7. *Vanessa (V.) atalanta* (Linné), the red admiral. First found on Hawaii by Perkins. Probably introduction after Blackburn's time (1876-1882) because Blackburn did not find it. Restricted to the island of Hawaii, except for a single worn specimen collected by Swezey on 27 June 1932 at Kumawela, Kauai, and preserved in the collection of the State Dept. of Agric., Honolulu.

8. *Vanessa (V.) tameamea* Eschscholtz, the Kamehameha butterfly. Endemic. Throughout the forests of all islands. Collected by J. F. Eschscholtz, surgeon-naturalist of the Russian Cpt.

Kotzebue South Seas and Bering Straits expedition 1815-1818, and described by him 1821. Zimmerman (1958) considers it to be a derivative of *Vanessa indica* (Herbst), a great wanderer—as he says—which is known from Madeira, the Canary and Balearic Islands, Portugal and southern Spain, and is widespread over the Indo-australian faunal region, even into the Marianas and vicinity. However, one has also to give some thought to the possibility, suggested by other authors, of an immigration from New Zealand, where *Vanessa* (*V.*) *gonerilla* (Fabricius) is endemic, via the Line Islands. The latter species is also nearly related to *V.* (*V.*) *indica*.

9. *Vanessa* (*Cynthia*) *cardui* (Linné), the painted lady. Cosmopolitan. Perkins (1913) considers it and the following as natural immigrants. Already found by Blackburn. On all islands.

10. *Vanessa* (*Cynthia*) *virginiensis* (Drury), Hunter's butterfly or the American painted lady. North America, Canary Islands, South America to Brazil. Already found by Blackburn. On all islands.

LYCAENIDAE

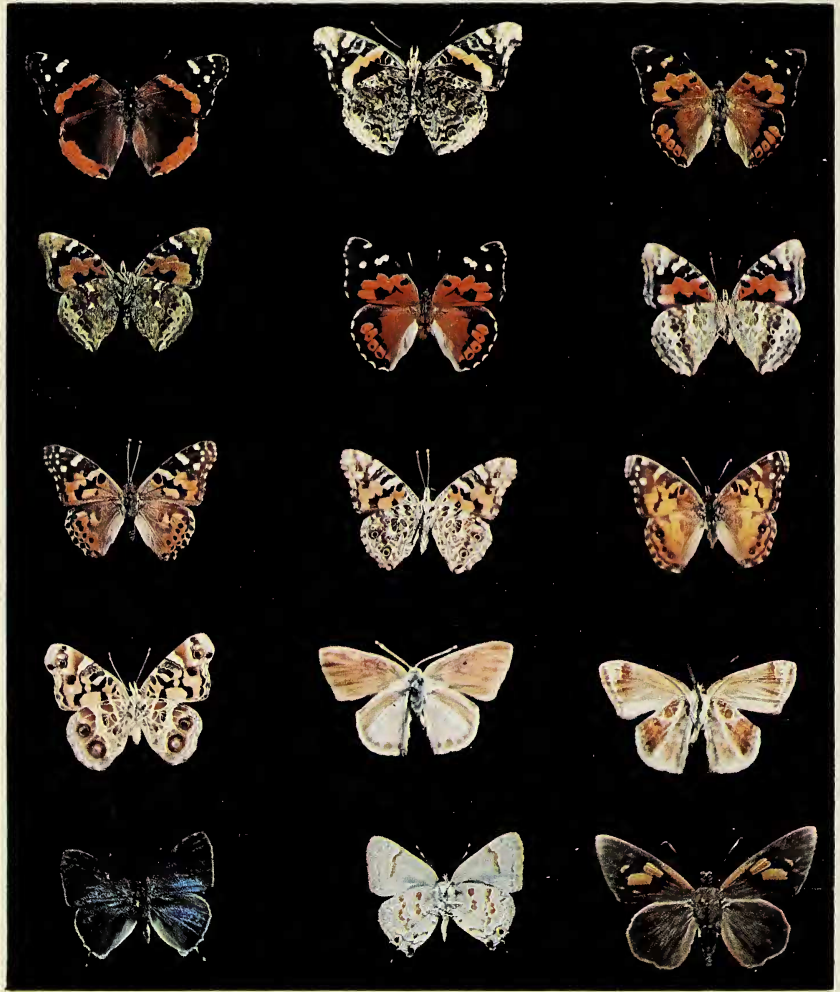
11. *Strymon bazochii* Godart, the smaller lantana butterfly. Purposely introduced from Mexico 1902 by Koebele to aid in the control of *Lantana*. On all islands. The population belongs to nominate *bazochii* not to the "subspecies" *gundlachianus* (Bates) —H. K. Clench *in litt*.

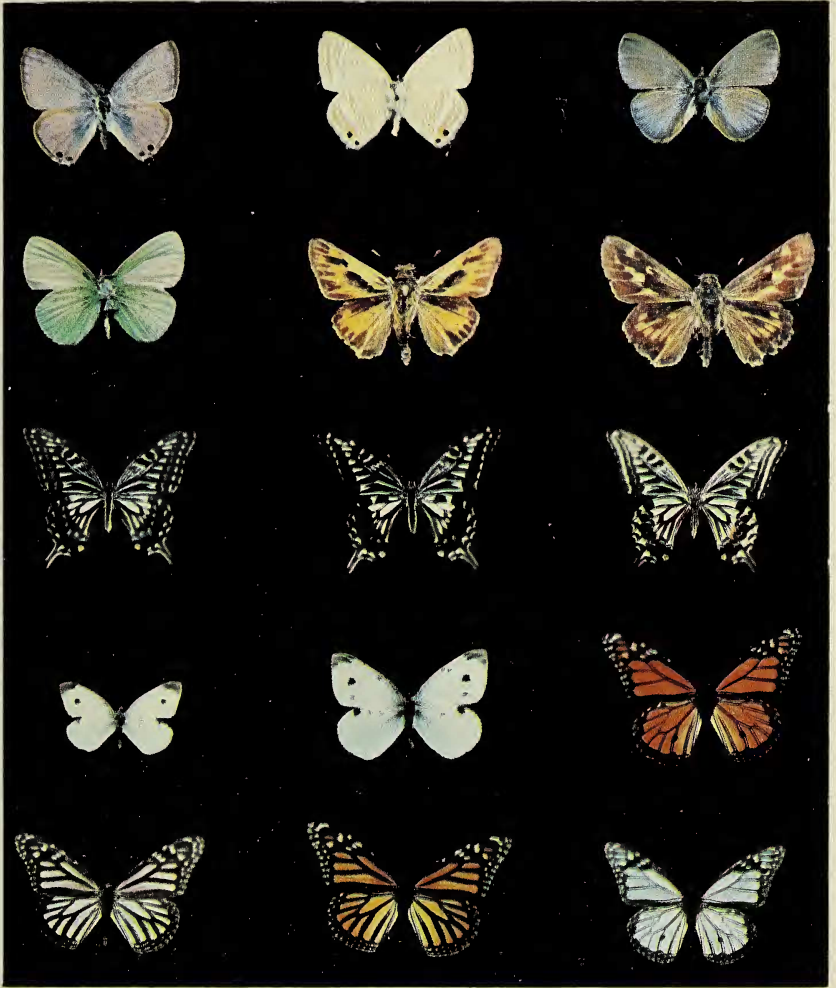
12. *Thmolus echion* (Linné), the larger lantana butterfly. Same as before. On all islands. At least on Oahu getting recently somewhat rare.

13. *Lampides boeticus* (Linné), the bean butterfly. Widespread from Africa, southern Europe to India and the Orient to Malaya and Australia. First taken by Blackburn before 1882. A very common butterfly on all islands.

14. *Vaga blackburni* (Tuely), Blackburn's blue. Endemic. On all islands. Not rare. Principal host plant *Acacia koa*. Zimmerman (1958) hypothesizes its origin from the Bonin Islands where the only known near relative, *V. ogasawaraensis* (Pryer) lives.

15. *Brephidium exilis* (Boisduval). Western pigmy blue. For the first time caught at the end of June 1978 at Hickam Airforce Base, Honolulu, and then again at the beginning of August by L. Nakahara *et al.*, Hawaii State Dept. of Agric. It is endemic





in southern Texas, strays north to Nebraska, ranges west to the Pacific, south to Venezuela. It has all the potentialities to become common.

From this list it can be easily understood that in our days all facts speak for the immigration of insects new to the Islands of Hawaii by airplane, from both sides, west and east, however, mostly from the west. There it is possible to trace many of them to Okinawa and Guam. This is still more underlined when we add to the butterflies our most recent newcomers among the Sphingidae:

Theretra nessus (Drury), first specimen taken at a light 14 August 1974 at Campbell Industrial Park at Barbers Point, west of Pearl Harbor. Known in Okinawa.

Deilephila nerii (Linné), first specimen taken at Hickam Air Force Base, 18 September 1974. Known in Okinawa.

Macroglossum pyrrostictum (Butler), in a house at Makiki, a Honolulu suburb, 11 July 1976. Known in Okinawa.

In the case of *D. nerii* the transport vehicle seems very well pointed at, in the other two cases at least the possibility according to presently available knowledge of distribution is given.

REFERENCES

- EHRlich, P. R., 1976. *Papilio xuthus* (Papilionidae) in Hawaii. *J. Lep. Soc.* 30: 149-150.
- HOWE, W. H., 1975. *The Butterflies of North America*. Doubleday and Co., Inc., Garden City, L.I., New York. 633 pp. + 97 pl.
- LEWIS, H. L., 1973. *Butterflies of the World*. Harrap, London. 312 pp. (208 pl.)
- PERKINS, R. C. L., 1913. Introductory essay on the fauna, in D. SHARP, *Fauna Hawaiiensis*, vol. I, part VI. University Press, Cambridge. 228 pp.
- ZIMMERMAN, E. C., 1958. *Insects of Hawaii*, vol. 7 Macrolepidoptera. University of Hawaii Press, Honolulu. 542 pp.

For continued information about Hawaiian insects, recent introductions, spreading of previously reported ones and related questions, use: State of Hawaii, State Department of Agriculture a.o., *Hawaii cooperative economic insect report*. This is a weekly publication which was begun in 1966.

PLATE 1: Read left to right and down. 1. *Vanessa atalanta* (Linne), Olaa, Oahu, dorsal view; 2. same, ventral view; 3. ♂ *V. tameamea* Esch., Kilauea, Oahu, dorsal view; 4. same, ventral view; 5. ♀ *V. tameamea* Esch., Kilauea, Oahu, dorsal view; 6. same, ventral view; 7. *V. cardui* (Linne), Pearl City, Oahu, dorsal view; 8. same, ventral view; 9. *V. virginiensis* (Drury), Leilehua, Oahu, dorsal view; 10. same, ventral view; 11. *Strymon bazochii* Godart, Honolulu, Oahu, dorsal view; 12. same, ventral view; 13. *Thmolus echion* (Linne), Palolo, Oahu, dorsal view; 14. same, ventral view; 15. ♂ *Erionata thrax* (Linne), Honolulu, Oahu, dorsal view.

PLATE 2: Read left to right and down. 1. ♂ *Lampides boeticus* (Linne), Mapulehu, Molokai, dorsal view; 2. same, ventral view; 3. ♂ *Vaga blackburni* (Tuely), Pauoa, Oahu, dorsal view; 4. same, ventral view; 5. ♂ *Hylephila phyleus* (Drury), Salt Lake, Oahu, dorsal view; 6. ♀ *H. phyleus* (Drury), Salt Lake, Oahu, dorsal view; 7. ♂ *Papilio xuthus* Linne, Kaimuki, Oahu, dorsal view; 8. ♀ *P. xuthus* Linne, Kaimuki, Oahu, dorsal view; 9. same, ventral view; 10. ♂ *Pieris rapae* (Linne), Nuuanu, Oahu, dorsal view; 11. ♀ *P. rapae* (Linne), Waikane, Oahu, dorsal view; 12. ♂ *Danaus plexippus* (Linne), Manoa, Oahu, dorsal view; 13. ♀ *D. plexippus* (Linne), Nuuanu, Oahu, dorsal view; 14. ♀ *D. plexippus* (Linne), Honolulu, Oahu, dorsal view; 15. ♀ *D. plexippus* (Linne), Waimanalo, Oahu, dorsal view.